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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/987,916	11/16/2001	Aki Suzuki	5988-036-27	7929

7590 02/27/2004

Supervisor, Patent Prosecution Services
PIPER MARBURY RUDNICK & WOLFE LLP
1200 Nineteenth Street, N.W.
Washington, DC 20036-2412

EXAMINER

WALKE, AMANDA C

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 02/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/987,916

Applicant(s)SUZUKI ET AL. **Examiner**

Amanda C Walke

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13-15 and 17-21 is/are rejected.
- 7) ☒ Claim(s) 1, 12 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/26/2002.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 1 is objected to because of the following informalities: The period on page 81, line 13, should be moved and placed after formula (3). Appropriate correction is required.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3, 5, 6, 8, 10, 13, 14, and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toshiaki et al. (JP 11-282163 in view of its English language abstract and based upon a spot translation by a PTO staff member; a full translation is not available at this time, but have been requested).

Toshiaki et al disclose a positive photosensitive composition comprising an acid generating compound and an alkali soluble photosensitive resin.

With respect to the photosensitive resin, the reference teaches that suitable monomers are those of formulas I, II, and III. Of the exemplified polymer resins of the reference, c's 1, 7-9, 12, 14-16, and 19-24 meet the limitations of the instant claims 1, 8-11, and 14. Polymers c 1, 7, 9,

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14, 19, and 23 are employed in the examples of the reference. According to the examples, the cited polymers meet the limitations of the instant claim 13. On page 32 of the reference, it is taught that acid-decomposable dissolution inhibiting compounds such as those of the instant claims 17 and 18 are preferably employed in the material of the reference. The reference further teaches on page 49, that an acid diffusion controller such as a nitrogen-containing organic compound is preferably included in the reference material, and in section [0153] of page 50, that suitable organic solvents include ethylene glycol monoethyl ether acetate, propylene glycol monomethyl ether acetate, methyl lactate, ethyl lactate, methyl methoxypropionate, and ethyl ethoxy propionate (instant claims 19-21).

With respect to the photoacid generator compound, the compound may be an oxazole derivative, S-triazine derivatives, an iodonium salt, a sulfonium salt, a disulfone derivative, or a diazodisulfone derivative, with sulfonium salts being preferred. These compounds may be used singly or in combination (claim 5).

One such compound, 4-11, which is employed in example 8 (see table on page 52) meets the structural limitations of the instant claim 1 for formula 1-a. However, the anion listed with the compound on page 24, does not, but given that the preferred anions of the reference are fluorine-substituted benzene sulfonic acid anion and a pentafluorobenzenesulfonic acid anion (which is paired with compound 4-7)(both meet the instant structural limitations for formula 1-b), it would have been obvious to one of ordinary skill in the art to replace the anion listed with 4-11 and replace it with either of the preferred anions with reasonable expectation of achieving a resist capable of reducing change of pattern forms and sensitivity (claim 3).

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5. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toshiaki et al in view of Uenishi et al (EP 1117002).

Toshiaki et al has been discussed above, and while the reference teaches that known sulfonium compounds may be employed as acid generators, specifically tri-phenylsulfonium compounds, the reference fails to specifically teach those claimed by the instant claims 2 and 4.

Uenishi et al disclose a photosensitive resin composition which comprises an acid generator which may be a tri-phenyl sulfonium compound. The reference discloses 14 preferred compounds beginning on page 43, and all 14 are taught to be equivalent by the reference. Compound I-4 meets the structural limitations of the instant claims 2 and 4. Compounds I-1 and I-2 are taught also in the Toshiaki et al reference, thus given that the reference teaches the equivalence of compound I1, 2, and 4, it would have been obvious tone of ordinary skill in the art to prepare the material of Toshiaki et al choosing to replace PAG 4-4 or 4-7 (I1 and 2 of the Uenishi et al reference) with I-4 of Uenishi given that the compounds are well known sulfonium acid generators and are taught to be equivalent by Uenishi et al with with reasonable expectation of achieving a resist capable of reducing change of pattern forms and sensitivity.

6. Claims 1, 5-11, 13-15, and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al (EP 908783) in view of Toshiaki et al.

Watanabe et al disclose a resist composition comprising an organic solvent, at least two polymers that are crosslinked , and a photoacid generator (page 32). The exemplified polymers of formulas 7 and 3b'-2 are of similar structure to those instantly claimed. Polymers 1-3, 5, and 8-15 meet the structural limitations of the instant claims 1, 8-11, 14, and 15. The solvents suitable to be employed in the invention include propylene glycol monomethyl ether acetate,

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propylene glycol monoethyl ether acetate, methyl 3-methoxypropionate, ethyl lactate, and ethyl 3-ethoxypropionate ([0094] page 33). A basic compound such as a N-containing organic basic compound which suppresses the rate of diffusion when the acid generated by the photoacid generator diffuses in the resist is preferably included (page 35). A diisolution regulator that enhances the contrast may also be included. The compounds exemplified by the reference on pages 43-46 meet the structural limitations of the instant claim 18.

The photoacid generator (PAG) of the reference may be an onium salt, a diazomethane derivative, a glyoxime derivative, and/ or a disulfone derivative, and these compounds may be used singly or in combination (page 33 and page 34 [see line 57]). Preferred among these compounds are triphenyl sulfonium compounds. Most preferred is a combination of an onium salt with a diazomethane compound. The reference fails to teach the use of a sulfonium salt meeting the limitations of the instant claims.

Toshiaki et al has been discussed above. As discussed above, the reference discloses several triphenylsulfonium PAG compounds. One such compound, 4-11, which is employed in example 8 (see table on page 52) meets the structural limitations of the instant claim 1 for formula 1-a.

Given the teaching of the reference that this compound is a preferred onium salt PAG, and the teaching of Watanabe that known onium salts may be employed in the material of its invention, it would have been obvious to one of ordinary skill in the art to prepare the material of Watanabe et al choosing to use the preferred sulfonium salt 4-11 of Toshiaki et al with reasonable expectation of achieving a material having high resolution, and plasma etching resistance.

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7. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al in view of Uenishi et al.

Both references have been discussed above.

The Watanabe et al fails to teach the use of a sulfonium salt meeting the limitations of the instant claims.

Uenishi et al disclose a photosensitive resin composition which comprises an acid generator which may be a tri-phenyl sulfonium compound. The reference discloses 14 preferred compounds beginning on page 43, and all 14 are taught to be equivalent by the reference. Compound I-4 meets the structural limitations of the instant claims 2 and 4.

Given the teaching of the reference that this compound is a preferred onium salt PAG, and the teaching of Watanabe that known onium salts may be employed in the material of its invention, it would have been obvious to one of ordinary skill in the art to prepare the material of Watanabe et al choosing to use the preferred sulfonium salt I-4 of Uenishi et al with reasonable expectation of achieving a material having high resolution, and plasma etching resistance.

Allowable Subject Matter

8. Claims 12 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record fails to teach or suggest to one of ordinary skill in the art to prepare a radiation sensitive composition as described by the instant claim 1 wherein the resin is partially cross-linked due to the presence of a cross-linker, or wherein the acid-dissociable group other than the resin B is a group as defined by claim 16.

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Conclusion

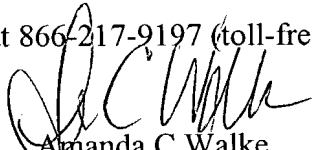
9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Aoai et al (EP 794457), Sato (EP 1267210), and Sato et al (JP 2000-231194 in view of its English language abstract) are cited for their teachings of similar photosensitive materials.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amanda C Walke whose telephone number is 571-272-1337. The examiner can normally be reached on M-R 5:30-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Amanda C Walke
Examiner
Art Unit 1752

ACW
February 8, 2004